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EXAMINER
ABRAHAM, AMJAD A

ART UNIT	PAPER NUMBER
1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,833	STANG ET AL.	
	Examiner	Art Unit	
	AMJAD ABRAHAM	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/15/2006, 06/09/2006, and 03/18/20087*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 13-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claim element "means for supplying the paste or suspension to and filling the extrusion chamber at a low pressure of less than 20 bar" as seen in claim 13 is a means (or step) plus function limitation that invokes 35 U.S.C. 112, sixth paragraph. However, the written description fails to disclose the corresponding structure, material, or acts for the claimed function. Specifically, the specification lacks disclosure as to what structure is needed in order to supply the paste at 20 bars of pressure. For example, is there a pump or other pressurizing means that pressures up the supply feed prior to entry into the extruder inlet port?

i. For examination purposes, examiner has interpreted this limitation to include any supply means that is capable of filling the extruder at a low pressure.

b. Claim element "means for moving the piston for applying a high pressure" as seen in claim 13 is a means (or step) plus function limitation that invokes 35 U.S.C. 112, sixth paragraph. However, the written

description fails to disclose the corresponding structure, material, or acts for the claimed function. Specifically, the specification lacks disclosure as to what structure is needed in order to utilize the piston in order to raise the pressure to 80 bars. For example, is there a pump or a hydraulic cylinder/ram assembly that pressurizes the concrete material in the mold?

ii. For examination purposes, examiner has interpreted this limitation to include any piston based pressurizing means that is capable of increasing the pressure within the extruder.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 5-6, 10-13, 17-18, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouvin et al. (GB 1,080,217—made of record by the applicant) in view of Krenchel et al. (US Pre-Grant Publication 2002/0140123) as evidenced by Ramachandran (V.S. (1995). Concrete Admixtures Handbook - Properties, Science, and Technology (2nd Edition). (pp. 808). William Andrew Publishing/Noyes).

4. Regarding claim 1, Rouvin teaches a process for extruding concrete bodies. **(See page 1 lines 10-12)**.

a. The process including the steps of:

i. Supplying a fluid concrete mix into a horizontal mold (extrusion chamber) at a low pressure, in which said horizontal mold utilizes a piston within the chamber. **(See page 1 lines 68-74, page 2 lines 80-87 + 115-126, and figure 6)**.

(1) The fluid concrete is gravity fed to the extruder (mold) unit at a low pressure. In this case, there is no pump or pressuring means being applied to feed the concrete into the extruder unit. Therefore, the pressure of the concrete feeding into the extruder would be due to the amount of concrete in the hopper. (More specifically, the height of the hopper). It is known that the density of concrete is roughly 2400 kg/m3. (See Ramachandran, V.S. (1995). Concrete Admixtures Handbook - Properties, Science, and Technology (2nd Edition). (pp. 808). William Andrew

Publishing/Noyes.). Applicant has claimed that the low pressure is to be less than 20 bars which computes to 204,000 kg/m2 of pressure. Dividing the pressure needed by the density of the concrete gives one having the ordinary skill in the art a height of 85 meters that would need to be achieved in order to get a pressure of 20 bars. So essentially, an 85 meter hopper would have to be used to garner an inlet pressure of 20 bars or over. Therefore it would have been obvious to one having the ordinary skill in the art to pump the concrete into the extruder unit at a lower pressure because hoppers over 50 feet high would not be used due to height constraints of most manufacturing facilities in addition to additional costs that would have been needed to support that size of a hopper.

ii. Applying a high pressure to the paste by way of a piston assembly to move the paste through the extruder and through a dewatering section. **(See page 1 lines 75-83 to page 2 lines 1-10, page 2 lines 92-114, and figure 6 part # 17)**.

iii. Removing a substantial mount of liquid by the pressure differential across permeable (perforated) wall. **(See page 2 lines 115-126)**

iv. Wherein the extrusion chamber has the same cross section as the final product. **(See page 1 lines 68-74)**.

b. With respect to claim 1, Rouvin does not teach wherein the high pressure is at least 80 bars.

c. However, Krenchel teaches wherein the pressure of the paste is between 20-400 bars as the paste goes through the dewatering section. **(See paragraph [0040-0041])**.

v. The pressure differential in Krenchel is between the pressure regulating chamber (part # 5 in figure 1) and the hydrostatic pressure of the concrete flow. Therefore, the pressure of the concrete going through the extruder system must be between 21-401 bars to achieve a pressure differential of 20-400 bars.

d. Rouvin and Krenchel are analogous art because they are in the same field of endeavor which is dewatering a concrete mixture prior to final molding. At the time of the invention, it would have been obvious to one having the ordinary skill in the art to modify the teachings of Rouvin to include the teachings of Krenchel in order to ensure a high pressure drop in the dewatering section (perforated sections) of Rouvin. The motivation for doing so would be to create a high pressure differential in the dewatering section in order to maximize the suction (vacuum) effect of the dewatering section. Rouvin expressly discloses that the hardening of the concrete occurs due to the pressure of the ram/piston assembly in order to eliminate excess moisture from the concrete. Therefore it would have been obvious to one having the ordinary skill in the art to modify the

teachings Rouvin to include the teachings of Krenchel to make the invention as claimed.

5. Regarding claim 5, Rouvin teaches wherein supplying the paste is through an inlet port can be placed at either end of the extrusion chamber. **(See part number 21 of figure 6 and page 2 lines 80-86 disclosing that the concrete is fed through an (orifice) which can be at either end of the mold.)**

6. Regarding claim 6, Rouvin teaches wherein the supply of paste is through an orifice (inlet port) which works in conjunction with the ram/piston assembly in order to fill the extrusion chamber with material on completion of an extrusion stroke. **(See page 2 lines 97-101)**.

7. Regarding claim 10, Rouvin teaches wherein gravity feed is used to supply low pressure cement to the extruder (molding) unit.

e. See discussion in 4(a)(i)(1)→ If 20 bars would require a supply hopper/column of 85 meters high, a 10 bar pressure requirement would be 42 meters or less. As stated above, one skilled in the art would typically not use a hopper that is 40 meters high due to structural requirements as well as special limits in a manufacturing plant.

8. Regarding claims 11-12, Rouvin does not teach wherein the high pressure is between 80-240 bars or more preferably 100 to 180 bars.

f. However, Krenchel teaches wherein the high pressure is between 20-400 bars.

g. At the time of the invention, it would have been obvious to one having the ordinary skill in the art to modify the teachings of Rouvin to

include the teachings of Krenchel in order to ensure a high pressure drop in the dewatering section (perforated sections) of Rouvin. The motivation for doing so would be to create a high pressure differential in the dewatering section in order to maximize the suction (vacuum) effect of the dewatering section. Rouvin expressly discloses that the hardening of the concrete occurs due to the pressure of the ram/piston assembly in order to eliminate excess moisture from the concrete. Therefore it would have been obvious to one having the ordinary skill in the art to modify the teachings Rouvin to include the teachings of Krenchel to make the invention as claimed.

9. Regarding claim 13, Rouvin teaches an apparatus for use in the extrusion of concrete bodies from fluid concrete mixture. **(See page 1 lines 10-12 and figure 6)**.

h. The apparatus includes:

vi. An extrusion chamber **(See part # 20 of figure 6)**.

vii. A piston for pressurizing the extrusion chamber **(See part #'s 16-18 (piston, cylinder, and ram) of figure 6)**.

viii. A dewatering section with permeable (perforated, holes) walls. **(See part # 25 of figure 6)**.

ix. The use of a hopper to supply low pressure concrete feed to the extruder system. **(See part # 22 of figure 6)**.

(2) See argument in 4(a)(i)(1) in reference to the hopper system being capable of supplying a low pressure feed.

x. A means for moving the piston for applying a high pressure to the concrete fluid and thereby forcing the concrete into the molding space and through the dewatering section. **(See part #'s 16-18 (piston, cylinder, and ram) of figure 6. Also see page 2 lines 21-25 and 80-126)**.

xi. Wherein the extrusion chamber has the same cross section as the final product. **(See page 1 lines 68-74)**.

i. With respect to claim 13, Rouvin does not teach wherein the high pressure is at least 80 bars.

j. However, Krenchel teaches wherein the pressure of the paste is between 20-400 bars as the paste goes through the dewatering section. **(See paragraph [0040-0041])**.

xii. The pressure differential in Krenchel is between the pressure regulating chamber (part # 5 in figure 1) and the hydrostatic pressure of the concrete flow. Therefore, the pressure of the concrete going through the extruder system must be between 21-401 bars to achieve a pressure differential of 20-400 bars.

k. Rouvin and Krenchel are analogous art because they are in the same field of endeavor which is dewatering a concrete mixture prior to final molding. At the time of the invention, it would have been obvious to one having the ordinary skill in the art to modify the teachings of Rouvin to include the teachings of Krenchel in order to ensure a high pressure drop in the dewatering section (perforated sections) of Rouvin. The motivation

for doing so would be to create a high pressure differential in the dewatering section in order to maximize the suction (vacuum) effect of the dewatering section. Rouvin expressly discloses that the hardening of the concrete occurs due to the pressure of the ram/piston assembly in order to eliminate excess moisture from the concrete. Therefore it would have been obvious to one having the ordinary skill in the art to modify the teachings Rouvin to include the teachings of Krenchel to make the invention as claimed.

10. Regarding claim 17, Rouvin teaches wherein supplying the paste is through an inlet port can be placed at either end of the extrusion chamber. **(See part number 21 of figure 6 and page 2 lines 80-86 disclosing that the concrete is fed through an (orifice) which can be at either end of the mold.)**

11. Regarding claim 18, Rouvin teaches wherein the supply of paste is through an orifice (inlet port) which works in conjunction with the ram/piston assembly in order to fill the extrusion chamber with material on completion of an extrusion stroke. **(See page 2 lines 97-101)**.

12. Regarding claim 22, Rouvin teaches wherein gravity feed is used to supply low pressure cement to the extruder (molding) unit.

l. See discussion in 4(a)(i)(1)→ If 20 bars would require a supply hopper/column of 85 meters high, a 10 bar pressure requirement would be 42 meters or less. As stated above, one skilled in the art would typically not use a hopper that is 40 meters high due to structural requirements as well as special limits in a manufacturing plant.

13. Regarding claims 23-24, Rouvin does not teach wherein the high pressure is between 80-240 bars or more preferably 100 to 180 bars.

m. However, Krenchel teaches wherein the high pressure is between 20-400 bars.

n. At the time of the invention, it would have been obvious to one having the ordinary skill in the art to modify the teachings of Rouvin to include the teachings of Krenchel in order to ensure a high pressure drop in the dewatering section (perforated sections) of Rouvin. The motivation for doing so would be to create a high pressure differential in the dewatering section in order to maximize the suction (vacuum) effect of the dewatering section. Rouvin expressly discloses that the hardening of the concrete occurs due to the pressure of the ram/piston assembly in order to eliminate excess moisture from the concrete. Therefore it would have been obvious to one having the ordinary skill in the art to modify the teachings Rouvin to include the teachings of Krenchel to make the invention as claimed.

14. Claims 2-4 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouvin et al. (GB 1,080,217—made of record by the applicant) in view of Krenchel et al. (US Pre-Grant Publication 2002/0140123) and in further view of Applicant's admitted art (hereafter, "APA", seen in page 1 lines 11-16 of applicant's specification) as evidenced by Ramachandran (V.S. (1995). Concrete

Admixtures Handbook - Properties, Science, and Technology (2nd Edition). (pp. 808). William Andrew Publishing/Noyes).

15. Regarding claims 2-4 and claims 14-16, the combination of Rouvin and Krenchel do not teach wherein: (1) the extrusion chamber has substantially the same principle cross sectional geometry or form as the final product and is pressurized using a piston with the same cross sectional geometry as the final product and fitting into the extrusion chamber; (2) wherein the suspension undergoes a cross section reduction of between 1:2 and 1:10; and (3) wherein the suspension undergoes a cross section reduction of between 1:2 and 1:10.

o. However, APA discloses that it is conventional reduce the cross-section of the final product through cross-sectional reductions through the extruder. **(See page 1 lines 11-16)**.

p. It is well known in the art that reducing the cross-sectional shape through an extruder will cause the pressure to increase and thus further packing a concrete molding body. Therefore, it would have been obvious to one having the ordinary skill in the art to adjust the packing of the concrete product by reducing the cross section of the extruder as the paste traveled through the extruder.

q. Therefore adjusting the cross sectional area of the extruder would adjust the pressure within the extruder and is thus a result-effective variable. Thus, it would have been obvious to one having the ordinary skill in the art at the time of the invention to adjust the cross sectional area for the intended application, since it has been held that discovering an

optimum value of a result effective variable involves only routine skill in the art. *In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)*.

16. Claims 7-9 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouvin et al. (GB 1,080,217—made of record by the applicant) in view of Krenchel et al. (US Pre-Grant Publication 2002/0140123) and in further view of Eggleton (USP No. 4,310,293) as evidenced by Ramachandran (V.S. (1995). Concrete Admixtures Handbook - Properties, Science, and Technology (2nd Edition). (pp. 808). William Andrew Publishing/Noyes).

17. Regarding claims 7 and 19, the combination of Rouvin and Krenchel does not teach wherein the leading face of the piston head is inclined with respect to the line of movement of the piston.

r. However, Eggleton teaches that a piston can be connected to a ram plate which is inclined and connected to the piston. **(See column 2 lines 61-68 and column 5 lines 19-33)**.

s. Rouvin, Krenchel, and Eggleton are analogous art because they are in the same field of endeavor which is moulding concrete. Each invention uses a piston assembly to compress and mold concrete. Furthermore, Eggleton uses the inclined plate to reduce the tendency of concrete to spill through any apertures or gaps in the extrusion unit. Furthermore, one skilled in the art would use a tapered or inclined piston head to apply a different cross sectional density to the concrete mold as

the packing pressure profile would be altered from this alignment. Therefore, it would have been obvious to one having the ordinary skill in the art to modify the teachings of Rouvin and Krenchel to include the teachings of Eggleton for the benefit of utilizing a piston head that could clean the surface of the extrusion unit while limiting any concrete spillage in extrusion unit.

18. Regarding claims 8 and 20, Rouvin discloses that on completion of an extrusion run the piston/ram assembly has a return stroke that allows concrete to enter the extrusion mold in front of the ram/piston for another run. **(See page 2 lines 96-101)**.

t. Clearly, as the concrete enters the extrusion mold it will fill around and clean the face of the piston/ram head. Therefore, it would have been obvious to one having the ordinary skill in the art to use an inclined face to allow for the filling operation to sweep on and clean the face of the piston head.

19. Regarding claim 9 and 21, Rouvin teaches wherein the extrusion chamber is refilled when the piston returns to original position. **(See page 2 lines 96-101 and page 1 lines 80-83)**.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMJAD ABRAHAM whose telephone number is (571)270-7058. The examiner can normally be reached on Monday through Friday 8:00 AM to 5:00 PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Phillip Tucker can be reached on (571) 272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AAA

/Philip C Tucker/
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